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Opening Statement on the FY 2004 President's Budget Request

U.S. Department of Health and Human Services
National Institutes of Health

Statement of the Director to the House Subcommittee on Labor-HHS-Education Appropriations on the FY 2004 President's Budget Request

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Good morning, Mr. Chairman and members of the Committee. Let me begin by expressing my deepest appreciation for the generous and bipartisan support of the Congress, Secretary Thompson, President Bush, and the American people for the completion of the doubling of the NIH budget this year. I recognize and appreciate the extraordinary effort of this committee and, Mr. Chairman, your leadership — without which the doubling would not have occurred. I thank you for it.

I also want to assure you that NIH fully understands and embraces its role as the steward of our Nation's investment in medical discovery. We must ensure that these precious resources are used wisely and lead to tangible benefits that touch the lives of everyone.

The year 2003 is truly a pivotal year for medical research. It is the year when we celebrate the 50th anniversary of the discovery of the structure of DNA and its direct consequence — the completed sequence of the Human Genome. We have witnessed nothing short of a revolution in science over the past 5 years. Some may see this year as the grand finale. I think of it more as the overture. As the 21st century begins to unfold, we are poised to make quantum leaps in our knowledge about how to improve people's health.

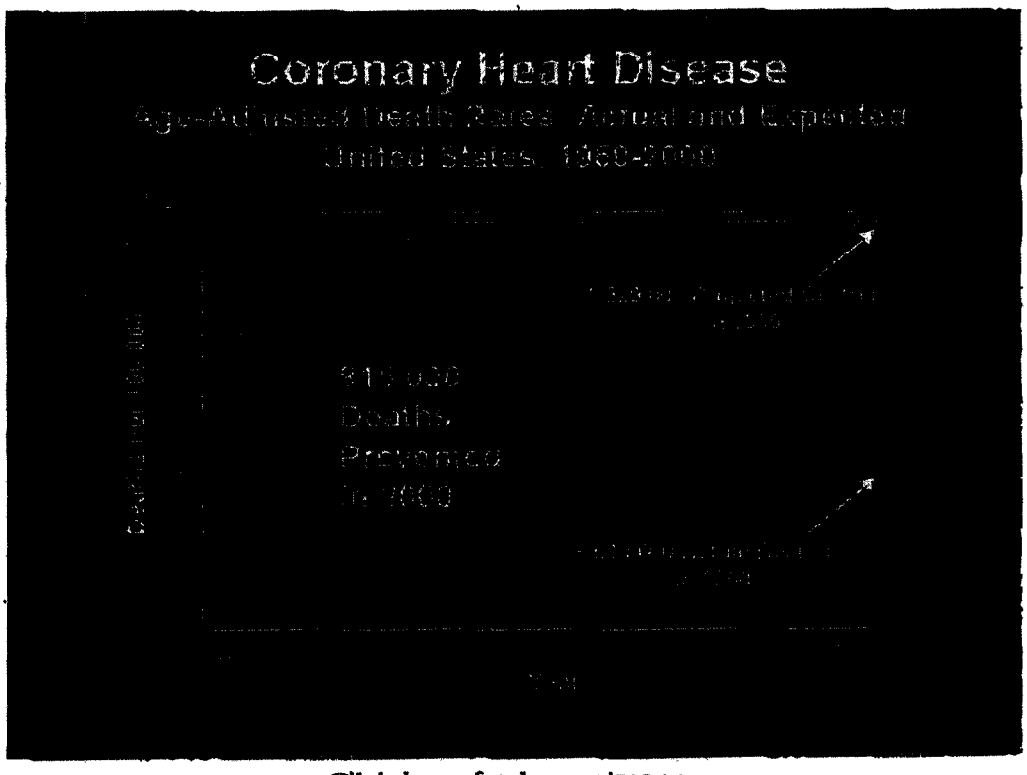
In my testimony, I will demonstrate what health benefits have resulted from the Nation's longstanding investment in the NIH, along with some of our most recent advances. Finally, I will outline emerging priorities and NIH's plans for responding to the health challenges before us.

The NIH Tradition

NIH-led progress in medical research is changing the landscape of disease. For example, NIH research led to a major reduction in mortality related to coronary heart disease and stroke. NIH contributed to this decline in a number of ways. First, we identified cardiovascular risk factors and the importance of behavior

modification, such as smoking cessation, dietary changes, and exercise, to reduce risk and improve cardiovascular health. Second, we supported the basic science that led to the development of pharmaceuticals to control hypertension and high cholesterol levels.

NIH-funded research also led to strategies as simple and inexpensive as taking aspirin to prevent heart disease and stroke, and life-saving procedures such as angioplasty and coronary artery bypass grafting. We also continue to evaluate best therapeutic strategies in medical practice, as in the recent ALLHAT trial (Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial) that showed that hypertension can be effectively managed with an initial choice of an inexpensive drug. Were it not for these advances and others, the expected death toll from coronary heart disease would have been over 1,300,000 in 2000 as compared to the actual death toll of 514,000.



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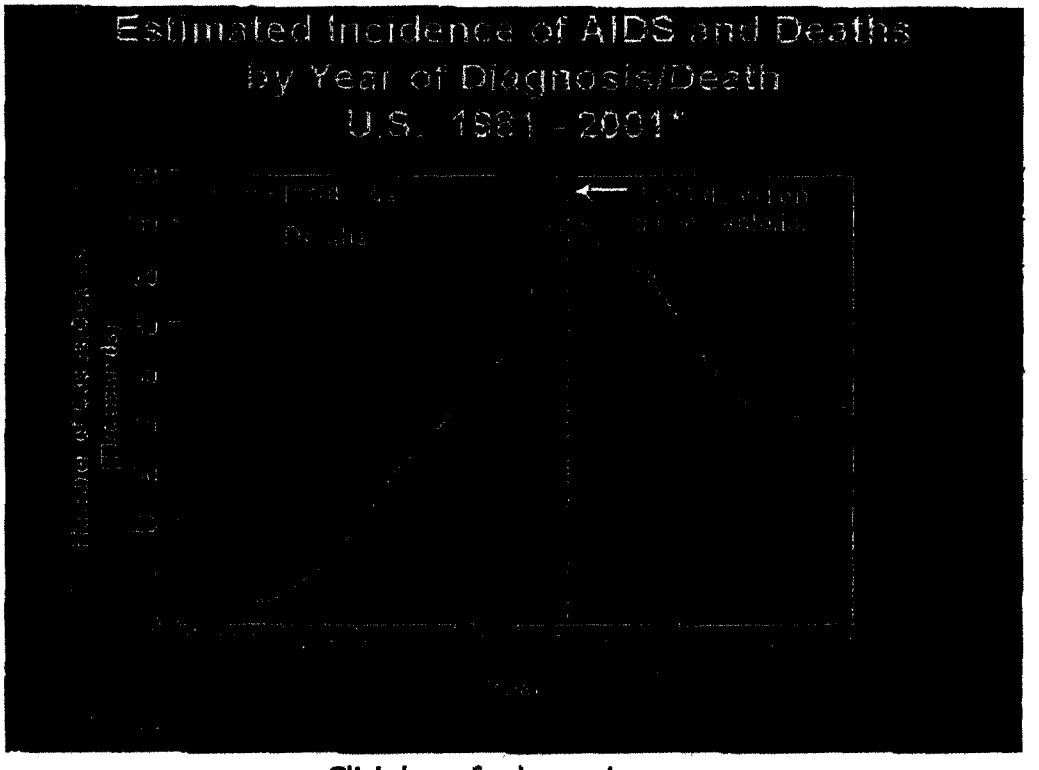
Progress has been equally remarkable for Hepatitis B (HBV) and Hepatitis C (HCV) infections. New cases of these infections are on the decline, in part, because of improved vaccines and the reduced risk of infection from blood transfusion — both outcomes of NIH-funded research. Because of changes in the criteria for donor recruitment and new and improved approaches to testing blood, the risk of infection through transfusion has been virtually eliminated.

The ability to screen for HIV infection — made possible by NIH research — serves as an important target for both prevention and treatment of AIDS. The mortality rate of this devastating disease is now one fifth of what it would have been without research on the fundamental biology of the HIV virus. Research on behavioral

interventions to prevent HIV infection and improve its treatment also contributed to better control of the spread of this disease in our country.



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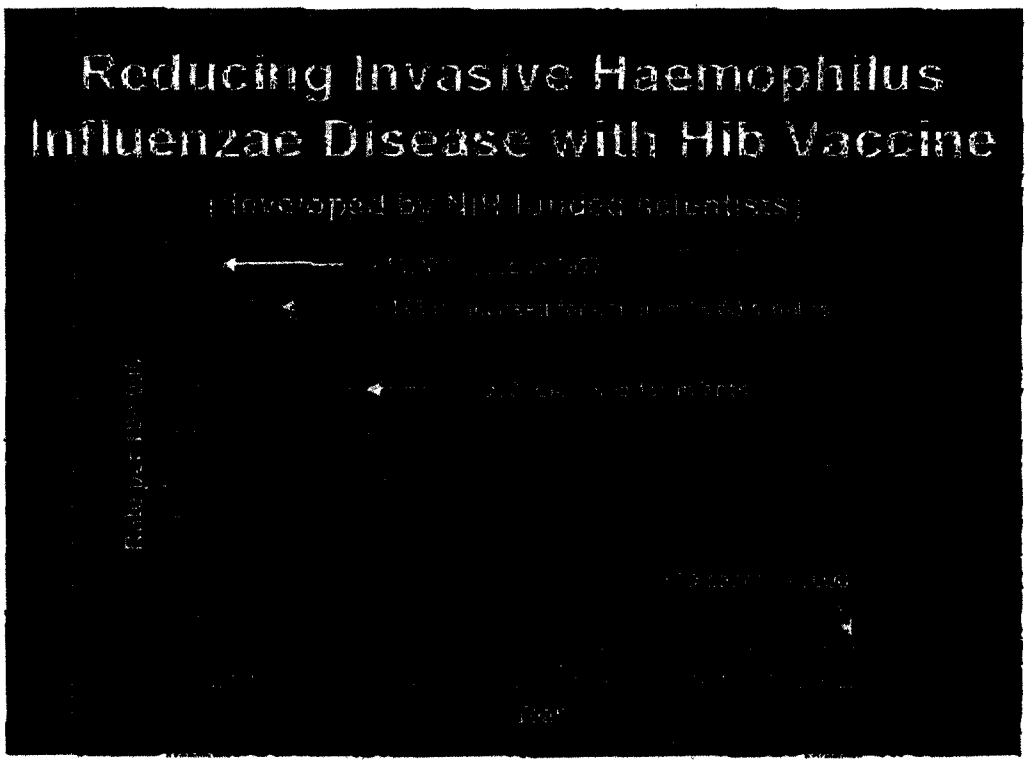
One more dramatic example can be found in the development of the *Haemophilus Influenzae* serotype b (Hib) vaccine. The results of this NIH research have led to a virtual elimination of this disease in our country (Figure 3) and, the disease is in the process of being eliminated worldwide. In the not too distant past, the complications of Hib made this disease the leading cause of acquired mental retardation in infants and children.



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New Challenges and Strategies
Due in part to research advances; the burden of disease is now shifting from more acute and lethal forms of disease to chronic illness. Our success in conditions like myocardial infarction and infectious diseases is leading to better survival rates. As the result of such prolonged survival and the aging of the population, the incidence of chronic and long-term diseases, such as congestive heart failure, cancer, Alzheimer's disease, Parkinson's Disease, diabetes, and obesity, among others, is increasing.

For example, although we have witnessed reductions in acute coronary heart disease, the burden of congestive heart failure has increased during the last 30 years of the 20th century. As another case in point, more people are living with cancer, as therapies transform this once acutely fatal disease into a more chronic and manageable condition.

Furthermore, rapid changes in our environment and lifestyle lead to disequilibrium between our genetic make-up and our ability to adapt to these changes. The most dramatic recent example is the rise in the incidence of obesity, due in part to the greatly increased availability of food and reduced daily physical energy requirements.

It is imperative that we develop more comprehensive strategies to address such emerging challenges. In all likelihood, these strategies will require a better understanding of: 1) the series of molecular events that lead to disease in the hope of affecting its course before the disease develops, so-called Molecular Prevention; 2) the interactions between genes, the environment, and lifestyle as they relate to

the etiology and progression of disease; ways of delaying the onset of the disease and/or ways to reduce the severity of its course and its impact on quality of life.

All of these strategies will need to be explored simultaneously and it is this systematic approach, from most basic to applied research, that will produce much needed results. Several important examples of these strategies have already proved their value.

For example, a major cause of blindness, age-related macular degeneration (AMD), currently affects 1.75 million Americans. They have advanced degeneration in at least one eye. Over 7 million individuals are at substantial risk of developing AMD. Its prevalence increases dramatically with age; for more than 15% of white females over 80 years of age have AMD. By the year 2020, the number of people with AMD will increase by 50% to 2.95 million.

NIH is engaged in a major research program to understand the predisposing factors, the clinical course, and the prognostic factors of AMD. Researchers found that giving high levels of antioxidants and zinc reduce the risk of developing advanced AMD by about 25 percent. These nutrients also reduce the risk of advanced AMD-induced vision loss by about 19 percent. These findings may help people who are at high risk of developing advanced AMD keep their vision. Over the next five years, 329,000 people in the United States (66,000 per year) could be saved from advanced AMD. More remains to be done. We need to spread the word to change practices, and we need to continue work to identify the genes that control the risk of this devastating disease as well as to develop more interventions to prevent or delay the onset of blindness.

In another example, many doctors today who are treating patients with rheumatoid arthritis remember all too well how challenging treatment was not so long ago. In the early 1980s, treatment was initiated in what was known as a therapeutic pyramid. Patients would first be given a course of aspirin or another non-steroidal anti-inflammatory drug (NSAID), and would be followed to see if erosions occurred in the bone. If erosions did occur or if the patients did not respond to the NSAIDs, the next course was anti-rheumatic drugs that were added one-by-one as the disease progressed. Sadly, the disease-modifying therapy was initiated only after the patient was already on the road to disability.

The root causes of the disease were not known, but the discovery, originally made through cancer research, of the role of Tumor Necrosis Factor (TNF), a naturally occurring protein in the body that mediates inflammation, dramatically changed the treatment landscape. By specifically targeting this protein with customized antibodies, entirely new drugs were developed and approved for the treatment of rheumatoid arthritis, including Etanercept and Infliximab. These were the first biological-response modifying antibody drugs that behave as antagonists — meaning that they work by specifically blocking the action and decreasing the availability of TNF.

These new, targeted therapies showed substantial effectiveness in people with rheumatoid arthritis who had not previously responded to other treatments. The treatments are generally well tolerated, although some concerns have been raised

recently about the long-term effects of these agents. Other studies reported that Infliximab and methotrexate used in combination not only reduced the symptoms of rheumatoid arthritis, but also halted the progression of joint damage when compared to the use of previous forms of therapy. Scientists involved in this study observed that in the last 2 years, rheumatoid arthritis research has moved further than in the previous 30 years, and that a wealth of new treatments is now available that have the potential to prevent and heal structural damage to the joints of people with this debilitating disease.

The Need for a Strategic Roadmap

The change in the landscape of disease requires us to adopt new approaches and accelerate the pace of our discoveries. The need has never been so pressing, the opportunities have never been greater, and challenges have never been more daunting. The NIH must simultaneously learn from the past, act in the present, and plan for the future. It must institute the changes necessary to improve the health of the American people. We need to proactively define enabling initiatives — how best to advance science as well as what science to advance. We need to map the terrain and over the past nine months we have been engaged in just such an effort.

Soon after I arrived at NIH, I convened a series of meetings to develop a "Roadmap." My goal was to develop a short list of the most compelling initiatives that the NIH should pursue that would make the biggest impact on biomedical research.

This assessment was needed because powerful and unifying concepts of biology are emerging that hold the potential to lead to rapid progress. For example, in the past, cancer research was considered vastly different than heart or brain research. Today, with recent discoveries in molecular and cell biology, we know that biological systems obey common laws and follow similar pathways in both health and disease. Efforts to fully understand these complex molecular events are beyond the reach of any one laboratory or group of investigators. As we begin to decipher the tidal wave of knowledge we have amassed, the scope, the scale, and the complexity of 21st century science will require us to devise even newer ways to explore biology for the sake of improving health.

Three major themes emerged from these Roadmap meetings. First, we must uncover new pathways to scientific discovery. For example, we must develop a comprehensive understanding of the building blocks of the body's cells and tissues and how complex biological systems operate. Also, structural biology will provide vital information about the proteins that make up the human body. Molecular libraries will give us new tools and targets for effective therapies. Overall, these examples, plus nanotechnology, computational biology and bioinformatics and molecular imaging will provide the foundation upon which new treatments, diagnostics and prevention strategies will emerge.

The second theme that emerged from our consultations is the changing dynamics of the research teams of the future. Because of the complexity and scope of today's scientific problems, traditional "mentor-apprentice" models must be replaced by integrated teams of specialists from numerous disciplines that were considered unrelated in the past. Imaging research, for example, requires cell

biologists, computer programmers, radiologists, and physicists to work collaboratively on new diagnostics and treatments.

The third theme that was voiced again and again by researchers is the need to re-engineer the national clinical research enterprise for optimal translation of our discoveries into clinical reality. The list of what is needed is long — it includes supporting multidisciplinary clinical research training career paths, introducing innovations in trial design, stimulating translational research, building clinical resources like tissue banks, developing large clinical research networks, and reducing regulatory hurdles. We must explore a standard clinical research informatics strategy, which will permit the formation of nation-wide "communities" of clinical researchers made up of academic researchers, qualified community physicians, and patient groups.

Our vision is to make sure that our citizens benefit from a vibrant clinical research system — a system that will allow us to more efficiently translate our breakthroughs in basic research with the goal of improving health.

The three thematic areas that I just described, that is, new pathways to discovery, multidisciplinary teams, and reengineering the clinical research enterprise, focus on technologies and systems that will enable researchers today and in the future to not only solve problems more quickly, but also to ask questions that we have not been able to ask before — questions so complex that without the aid of these efforts they would be impossible to address.

Efforts to understand the building blocks of the body's cells and tissues and to understand how complex biological systems work can lead directly to new approaches to improving health or preventing disease. A recently discovered biological phenomenon called RNAi — or RNA interference — has led to the development of a new and potent research tool, which is being used to identify the function of specific genes in normal biological and disease processes.

A recent study, co-funded by NIH, used RNAi to identify genes involved in the regulation of fat metabolism in the roundworm experimental model in an effort to better understand obesity. One at a time, each of the 17,000 genes of the round worm was turned off using this novel method. Researchers found that inhibition of 305 genes decreased body fat, whereas inhibition of 112 genes increased fat storage. With this information, researchers identified new genes involved in fat metabolism, genes common in many organisms, including humans. These genes now give researchers multiple new opportunities for understanding obesity and new targets for the development of therapies. This is just one example of how these new approaches are beginning to transform medical research.

Finally and importantly, the NIH must communicate our research results both to the lay public and health professionals. NIH works in partnership with many different organizations to communicate scientific results and health information to the medical research community, health care providers, patients, the media and the general public across the nation. We conduct our education and outreach efforts in collaboration with other federal agencies, state agencies, private sector organizations and national health care organizations. We have made progress in

this area. For example, the NIH Web site is now the most accessed of all government health and science web sites. This aspect of our mission will continue to be a priority for NIH.

Biodefense
Civilian biodefense research has become a new core priority at NIH and a prominent component of our budget. Over the last year and a half, we responded to the most urgent needs of biodefense, namely the development of countermeasures such as vaccines, therapeutics, and diagnostic tests. These will allow us to respond to and control the intentional or unintentional release of agents of terrorism that affect human health, including infectious disease and microbial toxins. We are also now systematically reviewing our portfolio of biodefense research to include radiation and chemical exposures, and mental health preparedness research. Biodefense research will be the topic of a separate hearing.

Mr. Chairman, I am pleased to present the President's FY 2004 request for the National Institutes of Health of $27,663 million for the programs of NIH that fall under the purview of this Committee. This level will allow us to support our highest research priorities and continue the momentum we gained during the historic doubling of the NIH budget. In large part this is possible because of the very significant amount of one-time costs supported in FY 2003 that will not be required in FY 2004. Once these have been taken into account, NIH will be able to increase the amount available for research by 7.5 percent. Even after excluding increases for the Administration's highest priority — homeland defense — the research components of the NIH budget will still increase by 4.3 percent. The request will allow us to support the highest number of new and competing grants in history — 10,509 new and competing grants. At this level, we will be able to continue to support approximately one-in-three of the research grant applications we receive. The final enacted FY 2003 appropriation is very close to the President's request. In the coming weeks, NIH will work with appropriate staff to clarify discrepancies between the FY 2003 request and the enacted level.

Special emphasis will be placed on areas of growing concern such as obesity and diabetes, the IDeA program, and the Best Pharmaceuticals for Children's Act. A total of $35 million is requested through the Director's Discretionary Fund to support our important Roadmap activities. As the FY 2004 budget is developed, NIH will work with appropriate staff to clarify discrepancies.

In sum, the plans I have outlined here today are ambitious — and rightly so. They rise to the many scientific opportunities and significant health challenges that lie before us. Once again, my thanks to you and the American public for your continued investment in biomedical research to improve the health of everyone.

Mr. Chairman, I would be pleased to respond to any questions.

Related Documents: NIH Statements for the Senate Appropriations Subcommittee, FY 2004 (Institute and Center Requests)